

**HERNIOSINA VOLUMINOSA: A NEW SPHAEROCERID OF ISOLATED
PHYLOGENETIC POSITION DESCRIBED FROM
NORTHEASTERN NORTH AMERICA
(DIPTERA: SPHAEROCERIDAE)**

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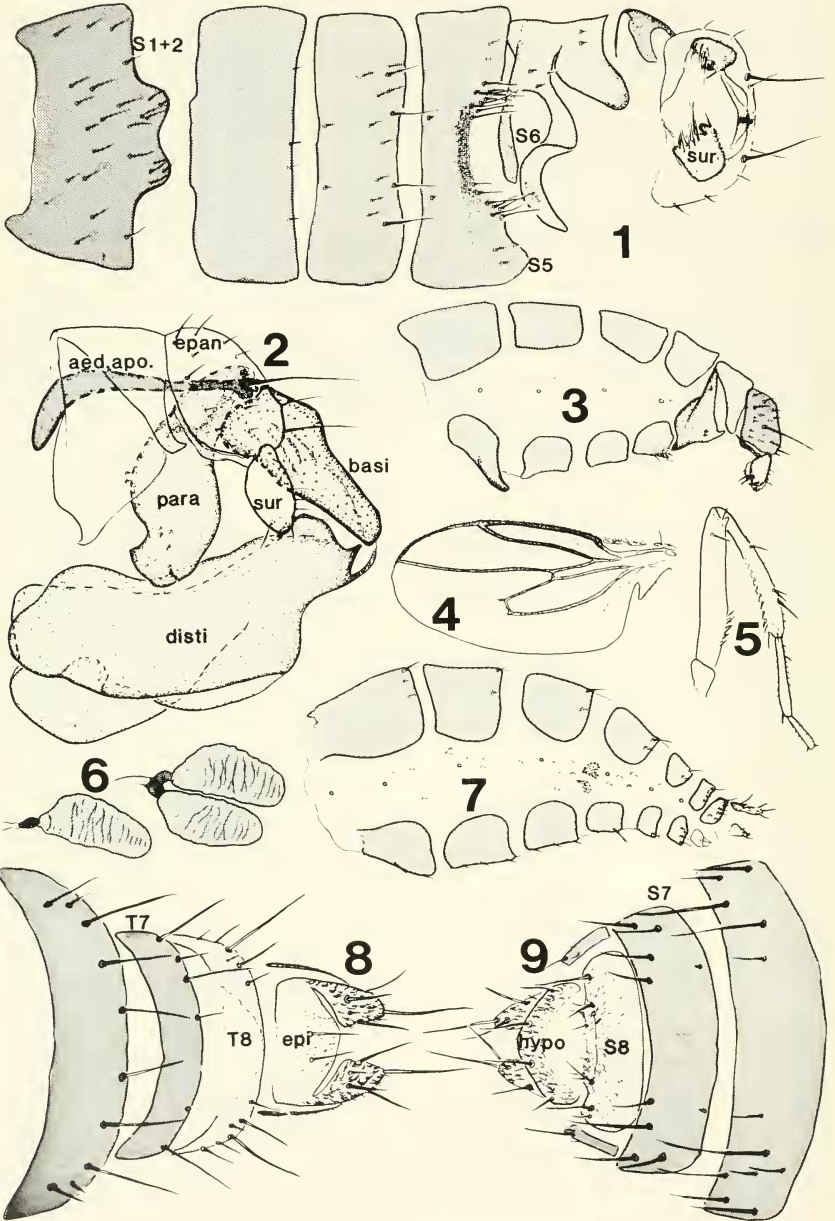
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Abstract.—*Herniosina voluminosa*, new species, is described from extensive series collected using flight intercept traps in northern New Hampshire. This highly autapomorphic species is included in the previously Old World genus *Herniosina* on the basis of a single putative synapomorphy, a modified male first sternite.

The genus *Herniosina* was described by Roháček in 1983 to include two similar European species characterized by a convex bulge on the male synsternite 1 + 2. The new species *Herniosina voluminosa* has a similar sternal bulge (Fig. 3) and also resembles described *Herniosina* in the following characters: discal cell long and narrow, alula narrow, R_{4+5} weakly sinuate and not bypassed by the costa, male mid tibia with a row of ventral spines, female mid tibia with apical ventral bristles only, female abdomen narrow and telescoping, and dorsocentral bristles in two pairs with the anterior pair short. Characters of the male terminalia, usually of great importance in determining phylogenetic affinity of the Sphaeroceridae, do not suggest a relationship between *H. voluminosa* and European *Herniosina* or any other genus. Despite this difference, *voluminosa* is included in *Herniosina* rather than in a new, monotypic genus on the basis of the possible synapomorphy of the male sternal bulge, a character not known elsewhere in the Sphaeroceridae. Other similarities between *voluminosa* and European *Herniosina* are probable plesiomorphies.

***Herniosina voluminosa* Marshall,
NEW SPECIES**

Description.—Body length 2.2–2.4 mm, dark brown to black, pruinose, minutely punctate; tarsi brown. Interfrontal plate very broad, subequal in height and width; bordered by 3 pairs of interfrontal bristles, middle pair cruciate and twice as long as upper pair, lower pair half as long as upper pair. Postocellar bristles present, small. Eye height 3 times genal height at point of maximum eye height; gena entirely pruinose; vibrissa as long as eye height; genal bristle short, equal to subvibrissa. Dorsocentral bristles in 2 pairs, prescutellar pair 3 times as long as anterior pair; acrostichal bristles long, in 6–7 rows, prescutellar pair slightly enlarged. Mid tibia of male with distal ventral row of spinules and a small apical ventral bristle (Fig. 5); mid tibia of female ventrally with apical bristle and apical anteroventral bristles only. Mid tibia of both sexes dorsally with one proximal anterodorsal, one distal anterodorsal, one distal dorsal, and one distal posterodorsal bristle (Fig. 5). Wing membrane brownish, dark brown along anterior margin; second costal sector 1.3–1.4



times as long as third in male, 1.2–1.3 times as long in female; alula narrow, pointed; discal cell long, narrow; R_{4+5} slightly sinuate, both R_{4+5} and costa ending near wing tip (Fig. 4). Scutellum 0.7–0.8 times as wide as long; surface densely tomentose; margin with 4 bristles and dense tomentum. Preabdominal tergites uniformly dark, weakly punctate, tomentose medially and bare laterally. First sternite of male bulged out to form posteromedial ventral lobe (Figs. 1, 3), first sternite of female not modified (Fig. 7).

Male terminalia.—Sternite 5 with a desclerotized membranous area surrounded by a dark band anteriorly and patches of long bristles laterally (Fig. 1). Sixth sternite large (Fig. 1). Epandrium small, with a long lateral bristle (Fig. 2); cerci trapezoidal, contiguous at corners, lighter in color than epandrium and with 2 long bristles. Surstylus small, simple, posteriorly setulose, ventrally setose; with a dark inner ventral lobe; left surstylus smaller than right (Fig. 1). Aedeagal complex unusually large, usually hanging well below axis of body. Distiphallus larger than epandrium; with broad, widely separated lateral lobes, right lobe distally broader than left (Fig. 2). Basiphallus elongate but without epiphallus or similar projection; ejaculatory apodeme small but well sclerotized. Paramere very broad, distally with a lateral row of setulae.

Female terminalia.—Terminalia retractile into preabdomen (Fig. 7); tergite 8 desclerotized medially, apparently divided (Fig. 8). Epiproct very pale except lateral margins which are fused with the short, setose cerci (Fig. 8). Sternite 8 brown; hypoproct with anterior part bare and transparent, crescent-

shaped posterior part brown and setulose (Fig. 9). Spectacles-shaped sclerites present as very narrow rings, not visible in cleared (KOH) specimens. Spermathecae dark, elongate and wrinkled, sclerotized part of duct very short (Fig. 6).

Types.—Holotype ♂ (Canadian National Collection) and 9 paratypes (1 ♂, 8 ♀): USA. New Hampshire, Coos Co., 3 mi. NE East Inlet Dam, Norton Pool, 12–24.vi.1986, Flight Intercept Trap, D. S. Chandler. Other Paratypes: USA. New Hampshire, 3 mi. NE East Inlet Dam, Norton Pool, 9–26.v.1986, Flight Intercept Trap, D. S. Chandler (3 ♂, 3 ♀); same, 27.v–11.vi (2 ♂, 1 ♀), 25.vi–9.vii (5 ♂, 3 ♀), 10–24.vii (4 ♂, 1 ♀), 17.ix–17.x (1 ♂); 1 mi. NE East Inlet Dam, 25.vi–9.vii.1986, 10–24.vii.1986, 25.vii–7.viii.1986, Flight Intercept Trap, D. S. Chandler (2 ♂, 1 ♀); Carr Co., 1 mi. N Wonalcet, E. Pk. Spring Brook, 16.iv–8.v.1985, 9–15.v.1985, 24–30.vii.1985, 29.viii–5.ix.1985, 6–17.ix.1985, Flight Intercept Traps, D. S. Chandler (5 ♂); The Bowl, 2.5 mi. NW Wonalcet, 15.iv–8.v.1985, 22.vi–1.vii.1985, 11–17.vii.1985, 14–21.viii.1985, 2–17.x.1985, Flight Intercept Trap, D. S. Chandler (5 ♂). Paratypes are in the University of New Hampshire Collection (Durham), the University of Guelph Collection and The Canadian National Collection (Ottawa).

Comments.—*Herniosina voluminosa* can be easily distinguished from all other Nearctic sphaerocerids by the distinctive male first sternite and the unusual interfrontal bristles. Other diagnostic characters include the fusion of the cerci with the epiproct (also found in *Opalimosina* and some *Kimosina*

Figs. 1–9. *Herniosina voluminosa*. Figs. 1–5. Males. 1, Abdominal sternites and terminalia, aedeagus and associated parts removed. 2, Terminalia, aedeagus and associated parts stippled, paramere pivoted anteriorly into an unnatural position to expose distiphallus (left lateral). 3, Abdomen, aedeagus and associated parts removed (left lateral). 4, Left wing. 5, Left middle femur, tibia and tarsomeres 1 and 2 (anterior). Figs. 6–9. Females. 6, Spermathecae. 7, Abdomen (left lateral). 8, Terminalia (dorsal). 9, Terminalia (ventral). Abbreviations: *aed apo*, aedeagal apodeme. *epan*, epandrium. *sur*, surstylus. *para*, paramere. *basi*, basiphallus. *disti*, distiphallus. *S6*, sternite 6. *S7*, sternite 7. *S8*, sternite 8. *hypo*, hypoproct. *epi*, epiproct. *T8*, tergite 8.

and *Opacifrons*) and the pigmented wing with a long discal cell. Males of *H. voluminosa* differ from all other sphaerocerids in their highly characteristic terminalia, in which the aedeagus and associated structures are extremely large and distinctive. Other, less obvious differences between males of *H. voluminosa* and other *Herniosina* include the presence of an ejaculatory apodeme, short broad cerci, a lateral (not dorsolateral) epandrial bristle, and an unmodified fifth tergite. The females differ markedly in the shape of the spermathecae, other *Herniosina* having smooth, pear-shaped spermathecae.

The entire type series was collected in flight intercept traps maintained by D. S. Chandler for a two year period in mature forest in northern New Hampshire. These traps also captured several other rarely collected species of Sphaeroceridae such as

Bitheca caballa Marshall, *Spelobia bispina* Marshall, *Spelobia frustrilabris* Marshall, *Terrilimosina pexa* Marshall, *Aptilotus spatulatus* Marshall, *Pullimosina antennata* Duda, *Pullimosina hirsutiphallus* Marshall, *Minilimosina gemella* Roháček and undescribed species in the genera *Aptilotus*, *Rudolfia* and *Spelobia*. With the notable exception of *Bitheca caballa*, which is known only from two specimens from Tennessee and Massachusetts, most of the other species (ca. 50 spp.) of Sphaeroceridae taken in the same traps as *H. voluminosa* are either northern Holarctic species or have their closest relatives in the northwest.

LITERATURE CITED

- Roháček, J. 1983. A monograph and re-classification of the previous genus *Limosina* Macquart (Diptera, Sphaeroceridae) of Europe. Part 11. Beitr. Entomol. Berlin 33: 3-195.